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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Miller et al. Group Art Unit: 2742

Serial No.: 09/205,809 Examiner: Tsegaye, S.

Filed: December 4, 1998 Docket No.: 1322/7

For: SYSTEMS AND METHODS FOR COMMUNICATING MESSAGES AMONG SIGNALING SYSTEM 7 (SS7) SIGNALING POINTS (SPs) AND INTERNET PROTOCOL (IP) NODES USING SIGNAL TRANSFER POINTS (STPs)

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AFFIDAVIT OF DR. HARRY G. PERROS PURSUANT TO 37 C.F.R. § 1.132

1. I, Dr. Harry G. Perros, am presently a professor in the Department of Computer Science, North Carolina State University, Raleigh, North Carolina. I have earned various degrees in computer science and authored various publications in the field of telecommunications. Details are provided as per my attached *curriculum vitae*.

2. I am familiar with signaling system 7 (SS7) signaling networks and Internet protocol (IP) networks. I have been requested by Gregory A. Hunt, patent attorney of record for applicants, to review United States Patent No. 5,923,626 to Curry et al. (hereinafter, "Curry") and the claims of U.S. patent application serial number 09/205,809 (hereinafter, "the '809 Application") and to provide my opinion as to whether it would have been obvious to a person of ordinary skill in the art at the time the invention was made, given the disclosure of Curry, to incorporate SS7-to-IP conversion functionality in a signal transfer point (STP), as claimed in the '809 Application.

3. After reviewing the relevant materials, it is my technical opinion that incorporating SS7-to-IP conversion functionality in a signal transfer point as claimed in the '809 Application would not have been taught or suggested to one skilled in the

art such as myself in light of the disclosure in Curry. My reasons for this opinion are set forth in detail below.

DISCUSSION OF CURRY PATENT

4. Curry discloses a system for providing transoceanic long-distance service using the Internet to carry call signaling traffic from a telephone network on one continent to a telephone network on another continent. In the Description of the Related Art beginning at column 2, line 1, Curry discusses computer networks in general, including a discussion of the TCP/IP Internet. The functions of the various layers in TCP/IP are discussed in detail. Nowhere in the Description of the Related Art does Curry mention that TCP/IP functionality could be included in a signal transfer point. Rather, such functionality is discussed as being performed by conventional computer network elements, such as routers, bridges, and host computers.

5. Following the discussion of computer networks, the Description of the Related Art of the Curry patent discusses telephone network control. In the telephone network control section, Curry discusses the difference between inband and out-of-band call signaling. One particular out-of-band call signaling protocol that is discussed is the signaling system 7 protocol. Curry discusses the functions of signal transfer points (STPs) as nodes that route SS7 signaling messages based on SS7 point codes in the messages. There is absolutely no teaching or suggestion in Curry to one skilled in the art such as myself that an STP can perform SS7-to-IP conversion functionality.

6. In stating the objects of the invention at column 9, line 29, Curry indicates that the purpose of the invention is to provide telephone service over wide areas between different telephone systems. In particular, Curry discloses that the main purpose of the invention is interconnecting transoceanic networks using the Internet. Again, there is no mention of providing SS7-to-IP conversion functionality in a signal transfer point.

7. In Figure 3 of the patent drawings, Curry discloses an SS7 network, including STPs **15** and **25**. The signaling links that connect STPs **15** and **25** to the remaining

network elements are disclosed as being common channel interoffice signaling links (see column 13, lines 2-5, of Best Mode For Carrying Out the Invention of Curry.). There is no disclosure that any of the signaling links connected to STPs **15** and **25** are or could be Internet protocol signaling links.

8. The next section of Curry beginning at column 13, line 30, discusses the SS7 protocol stack and the functions provided by various layers of the SS7 protocol. With regard to the functions performed by STPs, Curry states that STPs include translation tables for routing based on DPC values in messages. STPs also include the capabilities for performing global title translation based on called party address information in received messages (see column 15, lines 47-57, of Curry). Providing SS7-to-IP conversion functionality in a signal transfer point would overburden a conventional signal transfer point in light of all the other functions required to be performed by a signal transfer point, unless the STP is completely redesigned to be more efficient. Such redesign would not have been obvious at the time the invention was made in light of the stand-alone Internet server **130** of Curry.

9. Figures 7A and 7B of the patent drawings of Curry illustrate the use of signal transfer points to connect local exchange carriers. In particular, Curry discloses that STPs may be included in inter-exchange carrier network points of presence to connect STPs of local exchange carriers. Thus, Figures 7A and 7B further support the fact that STPs are conventionally used only to communicate with other network elements, i.e., STPs, SCPs, and SSPs, via the SS7 call signaling protocol.

10. Figure 8 of the patent drawings of Curry illustrates the internal structure of a service switching point or end office. With regard to functions performed by the SSP, Curry states:

> "A CCIS terminal **73** and an associated data unit **71** provide a signaling link between the administrative module processor **61** and an STP of the SS7 signaling network, for facilitating call processing signal communications with other central offices (COs) and with one or more

of the SCPs and/or the ISCP **17**." (See column 17, lines 37-43, of Curry.)

11. As the above-cited passage indicates, SSPs do not have signaling link connections to any other SS7 network elements other than an STP. SSPs are dependent on STPs for carrying all signaling traffic to other end offices and SCP databases. Thus, the STP is at a critical, high-traffic position in an SS7 network. In light of the critical SS7 communications functions performed by an STP, Figure 8 of the patent drawings of Curry suggests that it would be undesirable to provide additional processing load on the STP caused by SS7-to-IP conversion.

12. Figure 9 of the patent drawings of Curry is an internal block diagram of an STP. In Figure 9, the STP includes interface modules 81 that provide two-way 56 Kbps or 64 Kbps SS7 connections to SCPs, ISCPs, and other STPs. Packet switch fabric **83** routes messages from one incoming data link to another incoming data link. Administrative module **85** allows maintenance personnel to maintain the STP and maintain SS7 translation tables used by the STP. There is no teaching or suggestion of SS7-to-IP conversion functionality within the STP.

13. In Figure 10 of the patent drawings, Curry illustrates an ISCP including an SCP database **293**. ISCP **17** is connected to STP **15**, which is also connected to SPs. Thus, Figure 10 further illustrates the criticality of communications provided by the STP.

14. Figure 11 of the patent drawings of Curry illustrates a simplified network for transoceanic communication. In Figure 11, both the foreign and local network use SS7 communications for local call signaling. However, in light of the absence of common channel signaling beyond point of presence **114**, Curry discloses that in-band signaling is used to connect the local network to the foreign network. This is the main problem solved by Curry, i.e., determining a replacement for in-band signaling when connecting transoceanic networks.

15. In Figure 12 of the patent drawings, Curry discloses a solution to this problem, namely, using internet **136** rather than a satellite link to connect transoceanic

networks. In order to provide SS7 signaling communications via internet **136**, Curry discloses server internet module **130**. Server internet module **130** is not part of and should not be considered part of STP **118**. Curry states that the connection between server internet module **130** and STP **118** is an SS7 link and that server internet module **130** need not even be connected to STP **118** (see column 19, lines 45-48 of Curry). Thus, Curry actually teaches away from incorporating server internet module **130** in STP **118** because Curry discloses that STP **118** is connected to server internet module **130** via an SS7 signaling link.

16. Figure 13 of the patent drawings of Curry discloses the internal structure of server internet module **130**. Such internal structure includes a domain name system server **114**, a DHCP server **116**, a router **110**, and a processor interface **112**. Providing such functionality in an STP would overburden the STP, unless the STP is redesigned to perform more efficiently. Such redesign can be difficult and certainly moreso than developing software for a stand-alone general purpose computer as illustrated in Curry. Thus, Curry teaches using a stand-alone computer to convert between SS7 and IP, rather than redesigning the STP.

17. With regard to the operation of the network illustrated in Figure 12 of the patent drawings, Curry discloses that STP **118** analyzes point code information in the packet and routes the message according to the translation table stored in the STP. The translation table recognizes the foreign prefixes one requiring modified handling and routes the packet to internet module **130** for transmission over the internet. Internet module **130** encapsulates the packet in the TCP/IP packet and sends the TCP/IP packet over the internet (see column 21, lines 12-30 of Curry.). Thus, Curry clearly separates the functions of the STP and server internet module **130**.

18. As further evidence that the functions performed by server internet module **130** and STP **118** are distinct, in Figure 15 of the patent drawings, Curry discloses an embodiment in which server internet module **130** is not even connected to STP **118**. In this embodiment, server internet module **130** is connected directly to SSP **104**. Thus, it is not within the contemplation of the Curry reference to provide SS7-to-IP conversion functionality within STP **118**.

19. In addition, the use of the Internet in Curry is only to make sure that the called party is not busy. For example, in column 21, lines 47-51, Curry states:

> If the called station **122** is not busy, the terminating end office **128** so informs the originating end office. A telephone connection is then constructed via the trunks, switching offices, and satellite link between the calling and called stations.

Curry does not explicitly teach that the call is set up over an IP network. Moreover, there is no teaching or suggestion in Curry of generating or sending IP-encapsulated TCAP messages.

CONCLUSION

20. In light of all of the reasons stated above, it is my considered opinion based upon my technical expertise and knowledge of the relevant telecommunications art that it would not have been obvious to a person of ordinary skill in the art at the time the invention was made to provide SS7-to-IP conversion functionality in a signal transfer point as claimed in the '809 Application in light of the disclosure of Curry.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both under § 1001 of Title 18 of the United States Code, and the such willful false statements may jeopardize the validity of the application on any patent issued thereon.

H. G. Perros — Oct. 11th 2000

Harry G. Perros — Date

Attachment: *Curriculum vitae* of Dr. Harry G. Perros